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The "Long Arm" of Childhood Health: Linking Childhood Disability to Late Midlife Mental Health

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Abstract

A growing body of research underscores the early origins of health in later life; however, relatively little is known about the relationship between childhood physical health and adult mental health. This research explores the relationship between childhood disability and depressive symptoms among a nationally representative sample of late midlife adults (N= 3,572). Using data from Waves 8–10 (2006–2010) of the Health and Retirement Study (HRS), a series of ordinary least squares (OLS) regression models were created to assess the number of depressive symptoms. Childhood disability was significantly associated with higher levels of depressive symptoms; however, late midlife social and health factors accounted for differences between those with and without childhood disability. Late midlife physical health appeared to be a particularly salient mediator. Individuals who experience childhood disability may accumulate more physical impairment over the life course, thus experiencing worse mental health such as greater depressive symptoms in late midlife.

Keywords

childhood disability; mental health; depressive symptoms; life course

Introduction

Physical and mental health in later life often reflects diverging life course histories. A growing body of research demonstrates the importance of early life circumstances for health in older ages. Prior research highlights the potential for childhood physical health to influence adult physical health. For example, Blackwell, Hayward, and Crimmins (2001) found that poor childhood health (measured as retrospective self-ratings of childhood health) was linked to increases in morbidity (chronic disease) in later life. Similarly, Haas (2008) observed greater functional impairment among older adults reporting poorer childhood health. Another body of literature has investigated the role of childhood mental health on adult mental health outcomes. In general, individuals afflicted with childhood mental health disorders have worse mental health profiles as adults (Fergusson & Woodward, 2002; Woodward & Fergusson, 2001).

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While empirical studies have observed an association between childhood health (both mental and physical) and adult physical health in later life such as morbidity and functional impairment, relatively few studies have explored whether childhood physical health shapes mental health in later life. Utilizing a life course perspective, there is theoretical and some empirical evidence to support that early-life physical health may directly and/or indirectly influence adult mental health such as levels of depressive symptoms. Accordingly, this research explores whether childhood physical health in the form of childhood disability predicts depressive symptoms among a nationally-representative late midlife cohort of American adults. Developing a better understanding of the early origins of mental health in later life may hold important insights for clinicians and policymakers interested in mental health promotion and interventions among older adults.

Life Course Perspectives of the 'Long Arm' of Childhood Health

Prior research has noted the 'long arm' of early life disadvantage regarding health outcomes in mid- to late-life, in which disadvantage may represent health disadvantage (e.g., poor fetal conditions, birth outcomes, or childhood diseases/conditions), socioeconomic disadvantage (e.g., poverty in childhood), early life trauma, or even stigmatizing labels (Hayward & Gorman, 2004; Sampson & Laub, 1997; Schafer, Ferraro, & Mustillo, 2011; Turner & Donald, 1995). Childhood health disadvantage appears to have a remarkably strong association with adult health. A large body of epidemoiological literature has connected *in utero* conditions or adverse birth outcomes (e.g., low birthweight) to a myriad of conditions in later life such as hypertension, cardiovasucular disease, stroke, lung disease, and diabetes, (see Osmond & Barker, 2000 or Wadsworth & Kuh, 1997). The fetal origins of adult chronic disease is sometimes refered to as the 'Barker hypothesis.' Barker (1998) posited that the main mechanism for the early origins of adult health is *in utero* programming in which the fetus adapts to limited nutrients or other *in utero* deficits and permantly changes physiological processes.

Similarly, there is some evidence to suggest that the biological programming may influence a person's mental health and functioning. Delays in functionally development (e.g., walking and speaking) have been observed among midlife adults diagnosed with schizophrenia (Wadsworth & Kuh, 1997). Furthermore, low birth weight is recognized as a predictor of poorer cognitive functioning and behavior problems (e.g., hyperactivity) among children (Scholtz & Philipps, 2009). Research has also found a link between prenatal adversity associated with famine and antisocial disorder as well as schizophrenia (Scholtz & Philipps, 2009). In relation to mood disorder such as depression, the results have been equivocal. Some studies have found low birth weight and prenatal adversity to be a risk factor of depression, yet others have found no association (Scholtz & Philipps, 2009). While there have been some mixed results in relation to mood disorders, taken together, this body of research implies that mental health in later life may have a biological origin that is measurable using childhood health markers.

There is also empirical and theoretical support that social factors associated with childhood health may shape adult mental health. Stemming from sociological and gerontological research, Cumulative Inequality theory (CI) (see Ferraro, Shippee, & Schafer, 2009)

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underscores the dynamic social processes that lead to inequalities in later life including health inequalities. In relation to mental health over the life course, CI theory emphasizes the potential for diverging mental health trajectories due to varying levels of exposure to risk factors associated with poor mental health outcomes. In particular, exposure to life stress may be a central mechanism for understanding mental health over the life course. There is a robust association between socioeconomic disadvantage and poorer mental health status; previous research suggests that much of this relationship is due to increased exposure to stressors associated with low socioeconomic status (SES) (Baum, Garofalo, & Yali, 1999). Those who experience financial hardship are more likely to exposed to more major negative life events (e.g., divorce, job loss, death of loved one, or health shock) (McLeod & Kessler, 1990). Given the empirical evidence linking childhood physical health to adult socioeconomic outcomes such as educational attainment, income, and employment, it is possible that poor childhood physical health may introduce barriers to socioeconomic achievement that leads to poorer mental health in later life. In other words, childhood physical health may indirectly influence mental health at older ages via social factors.

Linking Childhood Disability to Mental Health in Later Life: Insights from the Aging with Disability Literature

This research investigates the role of childhood physical health for mental health (i.e., depressive symptoms) in later life. Specifically, childhood disability is used as a measure of childhood physical health. Prior studies have mostly relied on measures of self-rated childhood health and the presence/absence of childhood conditions. Childhood disability as a measure of childhood physical health may be more useful relative to self-ratings of childhood health because a global measure of health may include subjective assessments of mental health. Additionally, childhood conditions typically include infectious diseases or acute conditions, which may not have the same long-lasting implications as chronic conditions. While some individuals who experience childhood disability may also recover from their underlying childhood health condition, many will have persistent or recurrent physical impairment over the life course. These individuals with lifelong impairment represent aging with disability. It is possible to gain insight into mechanisms linking childhood disability and mental health in later life from aging with disability research.

Previous research has noted that those aging with disability experience secondary conditions such as depression more frequently than those with disability onset in later life (Klingbeil, Baer, & Wilson, 2004; Thompson, 2004; Putnam & Stoever, 2007). Additionally, individuals aging with disability may experience *accelerated aging* due to the combined effect of a “smaller reserve capacity to accommodate age-associated changes” and “increase[d] susceptibility to secondary health conditions” (Thompson, 2004, p. 107). The aging with disability research highlights the potential for those with early-onset of disability to accumulate more physical impairment over the life course, which, in turn, influences risk of depression. In general, the association between depression and disability is quite robust; Turner and Noh (1988) demonstrated a markedly elevated risk of depressive symptoms for physically disabled men and women of all ages. To illustrate, the prevalence of depression among disabled respondents was nearly triple that of the nondisabled group. Moreover, there is a wealth of research that has documented a link between depressive symptoms and

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disability among older adults. The relationship between disability and depression appears to be bidirectional—that is depression is a risk factor for disability and disability is a risk factor for depression (Bruce, 2001; Lenze et al., 2001); however, there is also evidence to suggest that changes in disability have the strongest effect on depressive symptoms (Ormel et al. 2001).

Research exploring aging with disability also draws attention to other sources of inequality for individuals with early onset of disability such as SES, social support, and health behaviors. Mann and Honeycutt (In Press) observed worse education and employment outcomes among individuals with disability onset in early life. Likewise, Clarke and Latham (In Press) found that adults aging with disability (i.e., measured as work limitations in young adulthood) were less likely to be employed, worked fewer hours, and had lower household incomes in late midlife. Additionally, Clarke and Latham (In Press) documented that those aging with disability were more likely to participate in poor health behaviors indicated by smoking status, obesity, and sedentary activity and were more likely to be never married. Other research investigating the impact of chronic illness among children echoes aging with disability research. Chronically ill children are more likely to exhibit mental health distress (especially depressive disorders) and are less likely to marry as adults (Cohen, 1999).

CI theory may help explain why individuals aging with disability—particularly those with childhood or early life onset—tend to experience more secondary conditions such as depression. Onset of disability early in the life course may shape life chances and lead to greater socioeconomic disadvantage among those aging with disability. These disadvantages may accumulate over the life course including more barriers such as fewer resources to manage the underlying health condition(s) and less access to necessary accomendations (see Badley, 2008). The systematic barriers and inequality experienced by those aging with disability, compared to those aging without disability, may manifest in higher rates of depression due to increased pain and fatigue, fewer psychosocial resources (e.g., mastery or social support), and more stress (Bruce, 1999; Fifield, Tennen, Reisine, & McQuillan, 1998; Jang, Haley, Small, & Mortimer, 2002; Trieschmann, 1987; Turner & Noh, 1988). Moreover, the process of accelerating aging may lead to more impairment or greater functional declines in later life among those aging with disability.

Drawing from multiple literatures from a variety of disciplines, there is theoretical and empirical support for linking childhood disability to mental health in later life. Yet, the empirical evidence linking childhood physical health to adult mental health is relativley limited. The majority of research exploring childhood health and adult health outcomes has focused on adult physical health. This research augments the extant literature by investigating whether childhood disability is associated with depressive symptoms in late midlife. Childhood disability as a measure of physical health is advantageous because it connects to the aging with disability literature, which contributes additional insights about social and health factors as potential mediators. While childhood disability may directly influence late midlife depressive symptoms due to both conditions sharing a biological source, it is anticipated that childhood disability indirectly influences late midlife depressive symptoms through adult SES, social support, health behaviors, and physical health. Consequently, there are two main objectives of this research. First, this research examines

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whether childhood disability is associated with late midlife depressive symptoms, net of demographic characteristics or childhood SES and mental health. Childhood SES and mental health are included as controls so that the childhood physical health could be assessed independently from other childhood circumstances. Second, this research explores to what extent late midlife SES, social support, health behaviors, and physical health are potential mediators. This research not only contributes to furthering our knowledge about the early-origins of mental health, it also may speak to interventions for individuals with childhood disability by isolating key mediators in late midlife.

Methodology

Data

Data for this research comes from Waves 8–10 (2006–2010) of the *Health and Retirement Study* (HRS). The HRS is an ongoing, nationally representative, longitudinal survey of older Americans, which sponsored by the National Institute of Aging (grant number NIA U01AG009740). The surveys are conducted by the Institute for Social Research at the University of Michigan. The initial objective of the HRS was to describe the lives of late midlife US adults with an emphasis on finances and health. At baseline (1992), face-to-face interviews were conducted for the HRS respondents and their spouses regardless of the spouses' age. Follow-up interviews have been conducted via telephone every two-years since baseline. In 1998 and again in 2004, additional cohorts were added to the HRS to create a representative sample of Americans 50 years or older.

Additionally, this project utilizes the most recent RAND HRS Data file (version L). The RAND HRS Data file is a user friendly, longitudinal data set created from original HRS data by the National Institute on Aging and the Social Security Administration (RAND, 2011). The sample (N=3,552) for this study includes all respondents and spouses who were between the ages of 50 and 60 years old in 2008 (without proxy) interviews with valid childhood circumstance data (approximately 2% of respondents were omitted due to missing data). Because of potential cohort effects influencing childhood disability rates (e.g., changes in medical technology) and increasing concerns in relation to healthy survivor bias as the sample ages, data was restricted to a late midlife cohort.

Measures

Dependent Variable—Included in the HRS is a short form of the Center for Epidemiologic Studies Depression Scale (CES-D) (Steffick, 2000). The CES-D was developed as a self-report depression scale for the general population and originally included 20 items (Radloff, 1977). Shorten versions of the CES-D have been created for older populations, which maintain the reliability and validity of the longer version (Kohout, Berkman, Evans, & Cornoni-Huntley, 1993). The HRS utilizes an 8-item version of the CES-D (i.e., CES-D 8) which asks, in the past two weeks, did the respondent feel: depressed, activities were an effort, sleep was restless, loneliness, sad, unmotivated, happy, or enjoyed life. Dichotomous measures were created for each item, where yes=1. For the last two items (i.e., felt happy or enjoyed life), the answers were reverse coded to reflect

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negative feelings. A CES-D index was created by adding the items together. The index ranged from 0–8 with higher scores reflecting more depressive symptoms.

Because depressive symptomology is sensitive to contemporaneous events and stressors, depressive symptoms were measured using the average number of depressive symptoms over three waves (2006–2010). This included the number of depressive symptoms before (Wave 8) and after (Wave 10) childhood disability was measured (Wave 9). Using the average number of depressive symptoms over a four year period reduces the likelihood that a respondent who is experiencing a brief period of increased symptomology is allowed to contribute a high number of symptoms to the analyses when it does not reflect his or her general late midlife mental health. Nevertheless, sensitivity analyses were completed using only Wave 9 (2008) depressive symptoms as the dependent variable (compared to the average number of depressive symptoms from 2006–2010) and the findings were nearly identical.

Independent Variables—Childhood disability was the independent variable of interest. Retrospective reports of childhood disability were asked of the respondents: “Before you were 16 years old, were you ever disabled for six months or more because of a health problem? That is, were you unable to do the usual activities of classmates or other children your age?” A dichotomous variable was created, where yes=1. Wave 9 (2008) was the first appearance of the childhood disability measure and was asked of all respondents. All independent variables were assessed at Wave 9 (2008) with the exception of childhood SES and mental health which also included measures from an internet survey conducted in 2006 and 2007. Childhood disability was used as a measure of early life physical health. Demographic characteristics were included in the analyses as controls and included sex, age, and race/ethnicity. A dichotomous measure of sex, where female=1 was used. Age was measured continuously in years and ranged from 50 to 60 years. A four-category variable was created for race with White (reference), Black/African American, Latino/Hispanic, and other race as the categories.

Childhood mental health and socioeconomic status (SES) were also included in the analyses in an attempt to control for early-life events such as childhood socioeconomic disadvantage and family (or biological) origins of mental health. For childhood mental health, a measure of childhood depression was used. The respondents were asked “before you were 16 years old, did you have depression?” The majority of respondents answered the childhood depression question in Wave 9 (2008); however, about one third of respondents answered these questions in 2006 and 2007 via an internet survey. Childhood SES was assessed using two variables: 1) moving due to financial hardship and 2) self-rated childhood SES. The respondents were asked about financial hardship: “While you were growing up, before age 16, did financial difficulties ever cause you or your family to move to a different place?” A dichotomous measure was created, where yes=1. Self-rated childhood SES was measured using the following question: “Now think about your family when you were growing up, from birth to age 16. Would you say your family during that time was pretty well off financially, about average, or poor?” An ordinal measure of self-rated childhood SES was created, where 1=poor and 5=well off financially. Childhood SES measures have been asked

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once of each respondent since Wave 4 (1998); therefore, the childhood SES financial hardship measure was collected in Waves 4–9 (1998–2008).

Four measures of late midlife SES were included in the analyses: 1) number of years of formal education; 2) whether a respondent was below the poverty threshold; 3) currently working for pay; and 4) household income. Late midlife SES was included as potential mediator of childhood disability and late midlife depressive symptoms. Number of years of formal education was measured continuously with a range of 0 to 17 years of education. The RAND HRS data set included a dichotomous variable of whether a respondent was "in poverty" or below the United States (US) Census poverty threshold from the past calendar year, where yes=1.

Late midlife social support was also included in the analyses as a potential mediator. Three variables were used to measure to social support: 1) marital status; 2) lives alone; and 3) low social participation. A categorical measure of marital status was created, where married/partnered (reference), divorce/separated, widowed, and never married were the categories. A dichotomous measure was created to denote individuals who were living alone; respondents who reported being the only member of a household were recoded as lives alone (=1). Similarly, a dichotomous measure of low social participation was created from the question: "How often do you get together with [people in or near the facility/any of your neighbors] just to chat or for a social visit?" Respondents who reported never or rarely ever getting together with neighbors or friends were classified as having low social participation (=1).

Four late midlife health behavior measures were used. A dichotomous measure of sedentary was created from three RAND HRS activity indices (i.e., light, moderate, and vigorous activity), where respondents reporting participating in no physical activity were classified as sedentary (=1). A dichotomous measure was created for obesity, where obese (BMI>30) =1. Smoking status was also included in the analyses. A trichotomous measure was created with the categories: never smoked (reference), former smoker, and current smoker. Additionally, a measure of alcohol consumption was employed. Respondents reported the number of days per week that they drank alcohol. The measure ranged from 0=never drinks to 7=drinks every day.

Finally, late midlife physical health was assessed using three measures of functional health (i.e., functional limitations, Activities of Daily Living (ADLs), and Instrumental Activities of Daily Living (IADLs). A large muscle functional limitation index (range=0–4) was included and comprised of four indicators: 1) difficulty sitting for 2 hours; 2) difficulty getting up from a chair; 3) difficulty stooping, kneeling or crouching; and 4) difficulty pushing or pulling large objects. Similarly, ADL and IADL indices were included in the analyses. Both indices were comprised of five common ADLs (i.e., difficulty bathing, dressing, eating, getting in and out of bed, and walking across the room) and IADLs (i.e. difficulty using the phone, managing money, managing medication, shopping, and preparing meals). For all three functional health indices, higher scores reflected more difficulty.

Analytic Strategy—A series of ordinary least squares (OLS) regression models were created to assess the number of depressive symptoms among the sample of respondents aged

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50 to 60 years. Seven separate models were created so that potential mediators could be evaluated including late midlife SES, social support, health behaviors, and physical health. Model 1 included only childhood disability which illustrates the bivariate association. Next, demographic characteristics (Model 2) were included as controls. Model 3 introduced childhood mental health and SES to control for early-life events. Models 4 through 7 introduced potential late midlife mediators. The aim was to test the pathways by which childhood disability shapes mental health in later life, net of demographic characteristics and other early-life circumstances such as childhood mental health. Model fit was assessed using the F statistic and adjusted R^2 values. With each additional model, there was an improvement in the adjusted R^2 values and model fit. All analyses were weighted using the HRS 2008 person-level weights. Likewise, robust standard errors were employed to adjust for clustering at the household level. Because an inventory of depressive symptoms represents count data, additional sensitivity analyses were completed using Poisson regression. A similar pattern of results were generated; therefore, the OLS models are presented for ease of interpretation.

Results

Table 1 presents a summary of the descriptive statistics of the sample by childhood disability status (N= 3,572). Compared to respondents without childhood disability, respondents with childhood disability reported having, on average, more depressive symptoms. Respondents with childhood disability were also more likely to report having childhood depression and financial hardship as a child. Fewer respondents with childhood disability were working for pay, relative to those without childhood disability. A higher proportion of respondents with childhood disability were divorced/separated or widowed. Similarly, a higher proportion of respondents with childhood disability were sedentary and current smokers. Respondents with childhood disability reported higher levels of physical impairment for all three physical health measures (i.e., functional limitations, ADLs, and IADLs).

Table 2 summarizes the results of the OLS regression. Unstandardized coefficients (and standard errors) are presented. Model 1 included only childhood disability which demonstrated a positive bivariate association ($p \leq 0.001$) between childhood disability and late midlife depressive symptoms. Model 2 introduced demographic characteristics as controls. Respondents with childhood disability, on average, reported 0.72 more depressive symptoms relative to respondents without childhood disability, net of demographic characteristics. Women and racial/ethnic minorities reported higher levels of depressive symptoms. In Model 3, childhood disability remained a significant predictor of late midlife depressive symptoms; however, after adjusting for childhood mental health and SES, the coefficient decreased to 0.51. On average, controlling for demographic characteristics and childhood SES and mental health, respondents with childhood disability reported about a half of a depressive symptom more than those without childhood disability. As to be expected, childhood depression was a particularly robust predictor of late midlife depressive symptoms; respondents with childhood depression reported, on average, about two additional depressive symptoms, relative to those without childhood depression. Childhood

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SES was also significantly associated; socioeconomic disadvantage was linked more depressive symptoms in later life.

With the introduction of late midlife SES (Model 4), childhood disability continued to be a significant predictor of depressive symptoms in late midlife. From Model 3 to Model 4, the magnitude of the childhood disability coefficient was substantially contracted. Similarly, with the inclusion of late midlife SES, the association between race/ethnicity and depressive symptoms was weakened. All of the late midlife SES measures were significant predictors with socioeconomic disadvantage being associated with higher levels of depressive symptoms in late midlife. Next, late midlife social support was introduced in Model 5. Again, childhood disability persisted as a significant predictor of depressive symptoms with a slight attenuation. Among the social support measures, marital status and social participation were significantly associated with depressive symptoms. Relative to married/partnered respondents, divorced/separated, widowed, and never married respondents reported greater levels of depressive symptoms. Low social participation was linked to higher levels depressive symptoms. With the introduction of the social support measures, sex was no longer significantly associated with depressive symptoms.

Model 6 introduced late midlife health behaviors. While childhood disability remained significantly associated with depressive symptoms, late midlife health behaviors attenuated the relationship. Being sedentary, obese, or a current smoker was associated with higher levels of depressive symptoms. In Model 6, sex became a significant predictor once again—suggesting a potential suppressor effect. In the final model (Model 7), childhood disability was no longer a significant predictor of late midlife depressive symptoms, suggesting that late midlife physical health was a particularly prominent mediator. Many of the other associations in the model were weakened when late midlife physical health was introduced. For example, sex and obesity were no longer significantly associated with depressive symptoms, while the magnitudes of the late midlife SES measures were attenuated. All three measures of physical health were significantly associated with late midlife depressive symptoms. Increased functional health impairment was associated with higher levels of depressive symptoms.

Because late midlife physical health appeared to be a particularly salient mediator, auxiliary analyses were completed to examine the significance of late midlife physical health as a mediator of childhood disability and depressive symptoms. Introducing late midlife physical health earlier into models without the other late midlife measures (i.e., SES, social support, and health behaviors) generated an insignificant association between childhood disability and depressive symptoms. Furthermore, a Sobel test of mediation was conducted for all three measures of midlife physical health and each measure produced a statistically significant test statistic (>4) with p-values less than 0.001.

Discussion

Childhood disability was significantly associated with depression in late midlife, net of demographic characteristics and childhood SES and mental health. However, the association between childhood disability and late midlife depression appeared to be mediated by late

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midlife social and health factors. These results suggest that childhood disability as a predictor of depressive symptoms in late midlife predominately works through social and health factors. These findings were anticipated based on theoretical evidence from CI theory. While this research does not suggest that there was a direct effect of childhood physical health on late midlife mental health, it does underscore the potential cascading indirect effects of social and health factors over the life course. Bivariate analyses illustrated that respondents with childhood disability were more likely to experience socioeconomic disadvantage as well as social support and health adversity. Furthermore, the aging with disability literature denoted the potential for late midlife physical health to be a key mediator, which was depicted in these results. Those with childhood disability may experience poorer mental health outcomes due to an excess burden of late midlife functional impairment. Taken together, these findings illustrate the ‘long arm’ of childhood disability, but emphasize the role of social and health factors as mechanisms linking childhood disability to late midlife mental health.

This research must be viewed in light of several limitations. Childhood disability was based on self-reports and may be subject to recall bias. Also, childhood disability represents a large variety of underlying conditions. While some information was available about the type of condition, unfortunately, over a quarter of respondents stated the cause of their childhood disability was “other or don’t know.” Musculoskeletal and heart/circulatory conditions were the most prevalent conditions reported (representing 44% of the causes listed). Because of the large proportion of non-valid responses, it was not feasible to include information about the nature of the childhood disability in the analyses. Additionally, individuals with poor childhood health are at greater risk of premature mortality—suggesting that childhood disability was underestimated (healthy survivor bias) among a late midlife cohort.

Likewise, this research would have benefited from better social support measures such as perceived social support from friends and family; however, these types of questions were limited to a leave-behind questionnaire that was not administered to all respondents in 2008. Given the relatively small sample size, using social participation (which was asked of all respondents in 2008) as a measure of social support appeared to be the best solution. Moreover, it would have been appealing to include measures of birth outcomes (e.g., birth weight) or young adulthood measures to further tease out the mechanisms linking childhood disability and late midlife depressive symptoms over the life course. This research is subject to key data limitations; however, there is still evidence to suggest that childhood disability significantly influences mental health in later life.

Conclusion

The results from these analyses have implications for research and policy. Childhood physical health (i.e., childhood disability) was associated with mental health in later life (i.e., depressive symptoms). Paralleling prior research exploring the ‘long arm’ of childhood health, this research demonstrates the far reaching repercussions of poor physical childhood health. The findings suggest that childhood disability indirectly shapes late midlife mental health through social and health factors. It appeared that late midlife physical health was an important mediator. The extant aging with disability literature underscores the potential for

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accelerated aging among those with early onset of disability. Furthermore, CI theory demonstrates the capacity of social mechanisms to produce physiological variations in the aging process. Individuals who experience childhood disability may accumulate more physical impairment over the life course due to more exposure to risk, thus experiencing greater mental health declines such as greater depressive symptoms in late midlife.

Individuals who have experienced childhood disability may be at an increased risk of depressive symptoms in later life. Because of the saliency of functional health as a mediator, interventions designed to improve or maintain functional health status for individuals with childhood disability could improve mental health outcomes. In addition, late midlife social support and health behaviors appeared to partial mediators, albeit in the absence of physical health measures, yet they may still be a fruitful avenue for exploring interventions aimed at improving mental health outcomes of individuals with childhood disability in older ages. This research also suggests that children and adolescents with disability could benefit from early-life programs and services that promote educational and employment opportunities. Socioeconomic status was another key mediator, and CI theory and prior empirical research highlights that children with poor health often face barriers to socioeconomic achievement which impacts their mental health over the life course. Similar to other research exploring the early origins of adult health, the findings from this research advocates for health promotion and intervention at every stage of the life course.

Recommendations for future research include the using prospective data with multiple measures of physical and mental health over the life course to more fully investigate the relationship between childhood physical health and adult mental health. Additional future research recommendations include investigating the role of childhood physical health for other mental health outcomes such as personality and mood disorders. Finally, the current literature would benefit from research exploring whether there are differences for health in later life between those who experience temporary childhood disability or poor physical health (e.g., acute childhood conditions) versus those who experience chronic childhood conditions that persist well into adulthood. It is possible that even a temporary bout of poor childhood physical health could have long-term repercussions for adult socioeconomic status and health due lost educational and cultural capital building opportunities.

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Table 1

Characteristics of Late Midlife Respondents by Childhood Disability Status: Health and Retirement Study 2008

	Childhood Disability=1 (N=138)	Childhood Disability=0 (N=3434)	Total (N=3572)	Signif.
Num. of Depressive Symptoms (range= 0–8)	2.18 (2.19)	1.49 (1.83)	1.52 (1.59)	***
Demographic Characteristics:				
Sex (female=1)	49.90	52.79	52.67	n.s.
Age (range=50–60)	57.12 (2.76)	57.13 (2.54)	57.13 (2.55)	n.s.
Race/Ethnicity:				
White	81.85	77.78	77.96	n.s.
Black/African American	6.67	10.67	10.50	n.s
Latino/Hispanic	7.21	8.57	8.51	n.s.
Other Race	4.27	2.98	3.03	n.s.
Childhood Mental Health and SES:				
Childhood Depression (yes=1)	10.71	3.49	3.79	***
Childhood Socioeconomic Status:				
Move Due to Financial Hardship (yes=1)	24.71	15.64	16.01	**
Self-Rated Family SES (range=1–5)	2.62 (1.24)	2.69 (1.11)	2.68 (1.11)	n.s.
Late Midlife Socioeconomic Status:				
Education (num. of yrs.) (range= 0–17)	13.68 (2.95)	13.54 (3.08)	13.54 (3.08)	n.s.
Below Poverty Threshold (yes=1)	10.46	9.54	9.58	n.s.
Currently Working for Pay (yes=1)	58.80	70.71	70.22	**
Household Income ($10,000)	7.61 (10.45)	9.09 (10.12)	9.03 (10.13)	n.s.
Late Midlife Social Support:				
Marital Status:				
Married/Partnered	65.60	72.22	71.95	n.s.
Separated/Divorced	16.61	17.97	17.91	n.s.
Widowed	8.33	4.71	4.86	*
Never Married	9.46	5.10	5.28	*
Lives Alone (yes=1)	19.22	16.29	16.41	n.s.
Low Social Participation (yes=1)	32.37	27.28	27.49	n.s.
Late Midlife Health Behaviors:				
Sedentary (yes=1)	6.90	2.90	3.06	**
Obese (yes=1)	41.33	36.04	36.25	n.s.
Smoking Status:				
Never Smoked				
Former Smoker	33.22	34.84	34.77	n.s.
Current Smoker	26.75	19.06	19.37	*
Num. of Days Per Wk. Spent Drinking (range 0–7)	1.29 (1.98)	1.31 (1.96)	1.31 (1.97)	n.s.
Late Midlife Physical Health				
Num. of Functional Limitations (range=0–4)	1.70 (1.49)	1.06 (1.03)	1.09 (1.35)	***

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	Childhood Disability=1 (N=138)	Childhood Disability=0 (N=3434)	Total (N=3572)	Signif.
Num. of ADLs (range=0–5)	0.61 (1.09)	0.18 (0.67)	0.20 (0.70)	***
Num. of IADLs (range=0–5)	0.36 (0.72)	0.14 (0.53)	0.15 (0.54)	***

Note: Bivariate analyses are based on weighted data using person-level weights; standard deviations are in parentheses where appropriate. Significance levels reflect chi-square tests (categorical variables) and differences of means; *≤0.05; **≤0.01; ***≤0.001.

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Table 2

Ordinary Least Squares Regression on Late Midlife Depressive Symptoms by Childhood Disability, Demographic Characteristics, Childhood Mental Health and SES, Late Midlife SES, Social Support, Health Behaviors, and Physical Health, (N= 3,552)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Childhood Disability	0.69*** (0.17)	0.72*** (0.16)	0.51*** (0.16)	0.40** (0.15)	0.36** (0.15)	0.30* (0.14)	0.04 (0.14)
Demographic Characteristics:							
Sex (female=1)		0.29*** (0.06)	0.22*** (0.06)	0.13* (0.06)	0.07 (0.06)	0.12* (0.06)	0.05 (0.06)
Age		0.02 (0.02)	0.01 (0.02)	−0.01 (0.02)	−0.01 (0.02)	−0.01 (0.02)	−0.01 (0.01)
Race/Ethnicity:							
White (ref.)		--	--	--	--	--	--
Black/African American		0.54*** (0.11)	0.45*** (0.10)	0.13 (0.10)	−0.00 (0.09)	−0.06 (0.10)	0.01 (0.09)
Latino/Hispanic		0.93*** (0.12)	0.77*** (0.11)	0.27* (0.11)	0.24* (0.11)	0.32** (0.11)	0.31** (0.10)
Other Race		0.74*** (0.19)	0.69*** (0.18)	0.48** (0.17)	0.47** (0.17)	0.49** (0.17)	0.42** (0.16)
Childhood Mental Health & SES:							
Childhood Depression			2.16*** (0.16)	1.93*** (0.16)	1.83*** (0.15)	1.74*** (0.15)	1.47*** (0.14)
Childhood SES:							
Move Due to Financial Hardship			0.40*** (0.09)	0.33*** (0.09)	0.27*** (0.09)	0.26** (0.08)	0.18* (0.07)
Self-Rated Family SES			−0.18*** (0.03)	−0.11*** (0.03)	−0.11*** (0.03)	−0.11*** (0.03)	−0.09*** (0.03)
Late Midlife SES:							
Education				−0.07*** (0.01)	−0.07*** (0.01)	−0.06*** (0.01)	−0.04*** (0.01)
Below Poverty Threshold				0.44*** (0.11)	0.27* (0.11)	0.26* (0.11)	0.16 (0.10)
Currently Working for Pay				−0.82*** (0.07)	−0.84*** (0.07)	−0.72*** (0.07)	−0.37*** (0.07)
Household Income ($10,000)				−0.02*** (0.00)	−0.01*** (0.00)	−0.01*** (0.00)	−0.01* (0.00)
Late Midlife Social Support:							
Marital Status:							
Married/Partnered (ref.)				--	--	--	--
Separated/Divorced					0.56*** (0.10)	0.52*** (0.10)	0.42*** (0.09)
Widowed					0.56*** (0.15)	0.50*** (0.15)	0.34* (0.14)

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	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Never Married					0.35* (0.15)	0.30* (0.15)	0.31* (0.14)
Lives Alone					0.05 (0.11)	0.06 (0.11)	0.13 (0.10)
Low Social Participation					0.42*** (0.07)	0.37*** (0.06)	0.28*** (0.06)
Late Midlife Health Behaviors:							
Sedentary						1.19*** (0.17)	0.43** (0.16)
Obese						0.14* (0.06)	−0.02 (0.06)
Smoking Status:							
Never Smoked (ref.)						--	--
Former Smoker						−0.02 (0.07)	−0.06 (0.07)
Current Smoker						0.43*** (0.08)	0.36*** (0.08)
Num. of Days Per Wk. Drinking						−0.02 (0.01)	−0.00 (0.01)
Late Midlife Physical Health							
Num. of Functional Limitations							0.36*** (0.02)
Num. of ADLs							0.20*** (0.05)
Num. of IADLs							0.31*** (0.06)
Constant	1.49	0.31	0.83	3.64	3.32	2.87	2.14
F	17.21***	21.76***	46.17***	66.94***	55.94***	48.97***	66.13***
Adjusted R^2	0.01	0.04	0.12	0.23	0.26	0.28	0.37

Notes: Unstandardized coefficients (standard errors); *≤0.05; **≤0.01; ***≤0.001.